

2010 Los Alamos Computer Codes (LA-CC)



LA-CC #	C#	Software Title	Software Description	Date
10-002	C10027	Master_LAMBS Vers. 1.0 beta	This software implements the MIMBS method for isotope identification and simulation of gamma ray spectra. It implements the MIMBS equation (equation 4) from the publication R. J. Estep, C. W. McSluskey, B. A. Sap, "The Multiple Isotope Material Basis Set (MIMBS) Method for Isotope Identification With Low and Medium Resolution Gamma Ray Detectors," Journal of Radioanalytical and Nuclear Chemistry, Vol 276, No. 3 (2008) 737-741, and other methods cited therein. Master_LAMBS has three main functions: (1) Isotope identification from gamma spectrum files: (2) Simulation of attenuated gamma spectra: and (3) creation and editing of "library files" used by Master_LAMBS	1/5/2010
10-003	C10030	FFD, "Fission Fragment Decay", Version 1.0	The FFD code implements a Monte Carlo version of the Hauser-Feshbach equations used to predict the evaporation stage of the primary fission fragments formed right after scission. Only neutron and gamma-ray emissions are allowed. A wealth of prompt fission neutron and gamma-ray data can be calculated. In the current Version 1.0, a simplified approach is used to treat the competition between the emissions of neutrons and gamma rays.	1/7/2010
10-004	C10031	Los Alamos Transferable Tight-binding for Energetics (LATTE), vers. 1.0	LATTE computes the energy and forces acting on atoms in molecular materials and solids using an implementation of the self-consistent charge transfer tight-binding approximation. Advanced algorithms allow computational cost to scale linearly with the number of atoms, facilitating large-scale, long-duration molecular dynamics simulations of dynamic phenomena using an explicitly quantum mechanical method. Precise energy conservation in quantum-MD is made possible via the extended Lagrangian Born-Oppenheimer MD formalism. Medium and long-range interactions in molecular materials are described and bond-making and breaking events are tolerated via spin polarization.	1/7/2010
10-005	C10038	APATHY version 2	The code computes the EOS of a partially ionized plasma by solving the Schrodinger equation for the electronic structure (bound and free states) around a point ion while considering interactions with identical neighboring ions in the HNC scheme. The output consists of the pressure and internal energy, ion charge, bound energy levels and wave functions, density of free states, and the structure of the fluid. Version 2 includes model and numerical improvements such as the QHNC model of liquid metals, a jellium model for the free electrons, and an improved HNC scheme.	1/12/2010
10-006	C10032	RCME (Renewable Capacity Mix Estimator), Vers. 0	RCME Vers. 0 performs a multi-variate analysis based on varying output weights for generating capacity to determine the optimal renewable plant mix, given input wind and solar resource data series. Output include the following calculated quantities: Total energy stored MWh (daily, yearly quantity); Firm load rating MW and renewable plant output MWh (yearly quantity); Total firming energy MWh (yearly quantity); Output variability +/-MWh (hourly quantity); Hourly plant output profiles for typical weeks (one from each season), and plant output duration curves for the year.	1/13/2010
10-007	C10033	Knowledge Preparation (Prepl.jar) Version 1.0	A series of Modules that together extract knowledge and dimensions out of unstructured text (documents). The graphical User Interface allows the user to select the different dimensions to compute from each document. It also creates a document viewer HTML rendering of the original text for user navigation. The final step in the process is the preparation of the dimensions to be imported into a Knowledge Base (Data Base). The code is modularized and calls on different external modules (commercial or open source). These external modules provide different capabilities, but could be replaced as needed.	1/14/2010
10-008	C10035	electronic Knowledge Management (eKM.jar) Version 1.0	The code implements a series of Digital Knowledge Management (DKM) operations on a Knowledge Base (KB) created earlier. In particular it allows the user to browse, and query the KB. It also allows the user to create subsets for comparison. For each subset a taxonomy is created based on the Knowledge extracted by the knowledge preparation process (Prepl.jar). These taxonomies are compared and the differences and similarities are displayed in a variety of ways. Time Interval Comparisons, SME, and All2All comparison results are displayed in a table and a graphical representation of the relationships between the subsets. Knowledge networks and shared published networks are displayed as graphs using an external open source module (Guess.jar).	1/14/2010

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10-009	C10036	DKM Web Services (DKMService.war) Version 1.0	The code implements a series of Digital Knowledge Management (DKM) operations based on user provided text. In particular it provides three web based services: FetchURL, kSigGeneration, and TaxonomyGeneration. A user invokes these services using a "Restful" interface. The service itself does not provide persistent storage capability, all knowledge is returned to the user. The taxonomy generation implements the following taxonomy comparisons: Time Interval Comparisons, Subject Matter Expertise, and All2All comparison results are displayed in an HTML table. Knowledge networks and shared published networks can be displayed as graphs using and external open source module (Guess.jar)	1/14/2010
10-010	C10037	Los Alamos Transferable Tight-binding for Energetics-Controlled (xxxLATTE) v. 1	LATTE computes the energy and forces acting on atoms in molecular materials and solids using an implementation of the self-consistent charge transfer tight-binding approximation. Advanced algorithms allow computational cost to scale linearly with the number of atoms, facilitating large-scale, long-duration molecular dynamics simulations of dynamic phenomena using an explicitly quantum mechanical method. Precise energy conservation in quantum-MD is made possible via the extended Lagrangian Born-Oppenheimer MD formalism. Medium and long-range interactions in molecular materials are described and bond-making and breaking events are tolerated via spin polarization.	1/14/2010
10-011	C12015	MCNP version 6.0 beta, 6.0.XX beta, 6.0, 6.0.XX, 6.x, 6.X.XX	MCNP6 is a general-purpose Monte Carlo N-Particle code that can be used for transport of 31 different kinds of particles, including, neutron, photons, electrons, protons, alphas, pions, muons and heavy charged particles. Specific areas of application include, but are not limited to, radiation protection and dosimetry, radiation shielding, radiography, medical physics. nuclear criticality safety, detector design and analysis, nuclear oil well logging, Accelerator target design, Fission and fusion reactor design, decontamination and decommissioning. In its development history dating from 1978, Los Alamos has spent more than 310 man-years developing MCNP. MCNP also contains modern parallel algorithms to effectively use a wide variety of computing platforms.	1/20/2010
10-012	C10042	pexec, v1	This (perl) script builds a machine list from command-line arguments on which an arbitrary command is to be run. Called in its most general form, pexec achieves parallelism by overseeing a fixed number of fork'd and execvp'd command processes marshalled by the host initiating the operation. If the string "%host%" is part of the command, names from the machine list are substituted in its stead. The output of the command on each machine is printed to the execution host's STDOUT by default.	1/25/2010
10-013	C10043	hybridize, v1	This (perl) script generates a list of files and/or directories suitable for building hybrid Perceus VNFS capsules. The list is optimal in the sense that it contains a minimal set of symbolic links back into the VNPS while ensuring that entries from a "whitelist" file reside in RAM. The generated list is unique to the /vnfs/root provided on the command line.	1/25/2010
10-014	C10040	HIV database SQL	The code generates schema for HIV database.	1/25/2010
10-015	C10044	DSD data analysis	This is a Mathematica notebook file for analyzing detonation shock shapes, for the purpose of calibrating the detonation shock dynamics model. The methods used in it have been described in several unlimited distribution papers. Examples are: 1) HILL LG, BDZIL JB. & ASLAM TD (1998) Front Curvature Rate Stick Measurements & Calibration of the Detonation Shock Dynamics Model for PBX 9502 over a Wide Temperature Range. 11th Symp. (Int.) on Detonation, Snowmass, CO. 2) HILL LG, BDZIL JB. DAVIS WC, ENGELKE R, & FROST D (1999) Front Curvature Analysis and Detonation Shock Dynamics Calibration for Pure and Sensitized Nitromethane. Shock Compression of Condensed Matter-1999	1/25/2010
10-016	C10039	Integrated Knowledge Engine (IKE) version 2.x	LA-UR-08-03952. We have developed an enhanced Bayesian analysis tool called the Integrated Knowledge Engine (IKE) for monitoring and surveillance. Our enhancements are suited for rapid response situations where decisions must be made based on uncertain and incomplete evidence from many diverse and heterogeneous sources. The enhancements extend the probabilistic results of the traditional Bayesian analysis by (1) better quantifying uncertainty arising from model parameter uncertainty and uncertain evidence, (2) optimizing the collection of evidence to reach conclusions more quickly, and (3) allowing the analyst to determine the influence of the remaining evidence that cannot be obtained in the time allowed.	1/27/2010
10-017	C10046	Jirga 1.2.2	Jirga allows the user to define political opposition groups based on a social-cultural-based data model. Groups can also be tracked by the events that have involved them through a tool that allows events to be entered and notated with metadata regarding source and analyst comments. Additionally, Jirga offers a flexible tool to aid in threat assessments of the groups. The engine driving the assessments is an indicators and warnings methodology that allows the user to assign the significance of an event as evidence. By continuously tracking political opposition groups, the threat assessments are conducted in a software environment that provides the appropriate context for understanding the meaning of an event to the group.	2/4/2010

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10-018	C10045	Fixed-Energy Response-Function Analysis with Multiple Efficiency (FRAM), version 5.X	The FRAM code is used to measure by gamma-ray spectrometry the isotopic composition of plutonium, uranium, and other actinides. It uses the peaks obtained with germanium detectors in the energy range from 30 keV to greater than 1 MeV.	2/4/2010
10-019	C10047	WELLS ver 1.0	The code performs groundwater simulations using analytical methods, allowing the consideration of multiple influences (i.e. pumping wells) and a temporal trend.	2/8/2010
10-020	C10048	SRFYDO 3.1	SRFYDO implements a statistical Bayesian methodology for predicting the reliability of multi-level, engineered systems as a function of age and up to two other degradation measures. This Los Alamos method improves on older techniques by integrating information from a variety of sources within a single analysis, utilizing data that would otherwise be discarded or incorporated ad hoc. It allows leveraging of information from related systems. Information sources may include scored results from direct tests, continuous and discrete nondestructive test-set measures at the component level, expert opinion, and similar-system tests.	2/8/2010
10-021	C10049	MIXSCAT Version 1.0	The program MIXSCAT is a tool to combine neutron-and x-ray pair distribution function (PDF) data to extract differential PDFs. It is intended to be distributed as part of the DISCUS package. Link: http://skywalker.lansce.lanl.gov/lujanJdownloadsoftwareDiffuse-win32-100121.exe Paper: C. Wurden, K.L. Page, A. Llobet, C.E. White and Th. Proffen, Extracting Differential Pair Distribution Functions using MIXSCAT, J. Appl. Cryst., submitted (2010). (LA-DR 10-00537)	2/10/2010
10-022	C10050	IPOD Data Converter, Version 1.0.0.1	The IPOD Data Converter application reads the .txt file produced by the Instrumentation Pod and repackages the data contained in the file into two new files, one that may be easily imported into Excel to view count and state of health information, and one that may be imported into Google Earth or other mapping programs to view location information.	2/12/2010
10-023	C10052	InfraMonitor Vers. 2.5	Code allows for both pipeline and analyst processing of infrasound data including the detection and location of infrasound events.	2/17/2010
10-024	C10051	Visual Crosswalk Analysis Tool (VCAT) version beta 2.0	VCAT is a knowledge modeling and analysis tool. It was synthesized from functional analysis, business process modeling, and complex network science. VCAT discovers synergies by analyzing natural language descriptions. Specifically, it creates visual analytic perspectives that capture intended organizational structures then overlays the serendipitous relationships that point to potential synergies within an organization or across multiple organizations. All organizations struggle to understand the relationships among projects in their portfolios and synergies that may link their interests with those of customers or other organizations. Org charts, enterprise workflows and other standard business representations show only the intended relationships and miss the rest. Social networking and data mining tools only show ad hoc relationships and ignore the business plan. VCAT was developed by LANL as a broad innovation capability for all large organizations that endeavor to understand their own resource utilization and potential for collaboration. The VCAT activity-centric data model is flexible enough to encompass enterprise relationships across any set of organizational units. Linkage analysis can reveal quantitative interdependencies relating resources, products, people, controls and outcomes.	2/18/2010
10-025	C10053	MAGVIZ Software Suite, version 2010.01.0	The MAGVIZ Software Suite (MAGVIZ-SS) performs data acquisition, data analysis, and graphical user interface (GUI) functions for the MAGVIZ liquid inspection system. This system applies nuclear magnetic resonance (NMR) and magnetic resonance imaging (MRI) technology to identify security threats in liquid form.	2/24/2010
10-026	C10041	TDC_MP.c, V1	The script is written for ROOT and it finds the lifetime (single and multi-component) of scintillating materials for data obtained with a pulsed x-ray system at LANL. The system was described in a report with LAUR 09-03851.	3/3/2010
10-027	C10056	PLBM3DPM, V1.0	The parallel lattice Boltzmann method code solves incompressible flow in three dimensional porous media (PLBM3DPM). The code was developed by Qinjun Kang based on published literature.	3/3/2010
10-028	C10057	SHMTools-I, 0.1 Beta	SHMtools-I is a MATLAB package that facilitates the construction of structural health monitoring (SHM) processes. The package provides a set of functions organized into modules according to the three primary stages of Structural Health Monitoring: Data Acquisition, Feature Extraction, and Feature Classification. The package includes various algorithms with source codes, along with structural data to serve as benchmarks for the evaluation of algorithms. This version is for use by internal LANL researchers only.	3/3/2010

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10-029	C10058	mFUSE-I: Function Sequencer for MATLAB, 0.1.00 Beta	mFUSE-I: Function Sequencer for MATLAB is a Java based graphical user interface for use with MATLAB. mFUSE-I facilitates the development of analytical processes by allowing users to quickly and intuitively connect MATLAB functions as steps in a sequence. Originally developed for use with a package of modular functions for Structural Health Monitoring, mFUSE-I provides researchers a means to quickly develop and compare analytical processes for any application. mFUSE-1 features a modern graphical display, drag-and-drop support, advanced m-file parsing, numerous saving options, and reconfigurable function library. This version is for use by internal LANL researchers only.	3/3/2010
10-030	C10055	ORCAS Mechanical Design Package and CAD Files	The Optimized Remote Chemical Analysis Spectrometer (ORCAS) is a compact hyperspectral imager for the long-wave infrared (LWIR) spectral region. ORCAS is a grating-based instrument incorporating aspheric refractive optics to achieve a palm-sized optics package measuring approximately 3.5"x3.5"x1.5" while keeping geometric distortions (smile, keystone, etc.) to near-negligible levels. With its current focal plane array (FPA), a 256x256 pixel HgCdTe array with 40-micron pixel pitch, ORCAS covers the 7.6 -13.5 micron spectral range in 256 spectral bands, with a spatial field of view of approximately 7 degrees. The ORCAS Mechanical Design Package includes all the design files in various CAD programs.	3/4/2010
10-031	C10054	ORCAS Optical Design Package	The Optimized Remote Chemical Analysis Spectrometer (ORCAS) is a compact hyperspectral imager for the long-wave infrared (LWIR) spectral region. ORCAS is a grating-based instrument incorporating aspheric refractive optics to achieve a palm-sized optics package measuring approximately 3.5"x3.5"x1.5" while keeping geometric distortions (smile, keystone, etc.) to near-negligible levels. With its current focal plane array (FPA), a 256x256 pixel HgCdTe array with 40-micron pixel pitch, ORCAS covers the 7.6 -13.5 micron spectral range in 256 spectral bands, with a spatial field of view of approximately 7 degrees. The ORCAS Optical Design Package includes all the optical design files written in ZEMAX.	3/4/2010
10-032	C10059	SHMTools, 0.1 Beta	SHMtools is a MATLAB package that facilitates the construction of structural health monitoring (SHM) processes. The package provides a set of functions organized into modules according to the three primary stages of Structural Health Monitoring: Data Acquisition, Feature Extraction, and Feature Classification. The package includes various algorithms with source codes, along with structural data to serve as benchmarks for the evaluation of algorithms.	3/4/2010
10-033	C10060	mFUSE: Function Sequencer for MATLAB, 0.1.00 Beta	mFUSE: Function Sequencer for MATLAB is a Java based graphical user interface for use with MATLAB. mFUSE facilitates the development of analytical processes by allowing users to quickly and intuitively connect MATLAB functions as steps in a sequence. Originally developed for use with a package of modular functions for Structural Health Monitoring, mFUSE provides researchers a means to quickly develop and compare analytical processes for any application. mFUSE features a modern graphical display, drag-and-drop support, advanced m-file parsing, numerous saving options, and reconfigurable function library.	3/4/2010
10-035	C10062	KIVA-3V release 2	KIVA3VRELEASE2 is a computer program for the numerical calculation of transient, two and three-dimensional, chemically reactive flows with sprays. It is a newer version of the earlier KIVA3 (1993) that has now been extended to model vertical of canted valves in the cylinder head of a gasoline or diesel engine. KIVA3, in turn, was based on the earlier KIVA2 (1989) and uses the same numerical solution procedure and solves the same sort of equations. KIVA3VRELEASE2 uses a block-structured mesh with connectivity defined through indirect addressing. The departure from a single rectangular structure in logical space allows complex geometries to be modeled with significantly greater efficiency because large regions of deactivated cells are no longer necessary.	3/11/2010
10-037	C10065	FastGamma	This software is for the Raytheon SWARM CRADA (LA07C10570-PTS-004). The purpose of this software is to simulate both background and radioactive source detection for numerous sources and/or isotopes. This is a vastly re-vamped and improved version of RadDetect (LA-CC-09-003).	3/18/2010
10-038	C10064	KIVA-4	KIVA-4 is the latest version of the series of KIVA codes. While KIVA-4 maintains the full generality of KIVA-3V, it adds the capability of computing with unstructured grids. Unstructured grids can be generated more easily than structured grids for complex geometries. The unstructured grids can be composed of a variety of elements including hexahedra, prisms, pyramids, and tetrahedra. However the numerical accuracy is less when the grid is not composed of hexahedra. KIVA-4 was developed to work with the many geometries accommodated with KIVA-3V which include 2D axisymmetric, 2D planar, 3D axisymmetric sector geometries, and full 3D geometries. KIVA-4 also features a multicomponent fuel evaporation algorithm.	3/19/2010

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10-039	C10066	WinNSigma 1.2	N-Sigma is the term used to describe the radiation portal monitor gamma alarm threshold, in units of the standard deviation of the background gamma count rate. The portal monitor separation, vehicle speed, and background count rate, among other factors, all enter into the N-Sigma calculation. The calculation of a gamma threshold is illustrated numerically. This code calculates N-Sigma for use in deciding what the gamma alarm threshold should be.	3/24/2010
10-040	C10067	LBM2DReaTran, V1.0	The LBM2DReaTran code solves coupled flow and reactive transport in two dimensional porous media. The numerical model and computer code were developed by Qijun Kang. Relevant publications: Q. Kang, Lichtner, P.C., and Zhang, D., An improved lattice Boltzmann model for multi-component reactive transport in porous media at the pore scale, Water Resources Research, 43, W12S14, doi:10.1029/2006WR005551 (2007).; Q. Kang, P.C. Lichtner, and D. Ahang, Lattice Boltzmann pore-scale model for multi-component reactive transport in porous media, Journal of Geophysical Research, 111, no.B5, p.B05203 (2006).	3/30/2010
10-041	C10068	Puppet Rowlf & Statler releases (no version numbers yet)	I would like to contribute to Puppet, which is software for the configuration management of Unix based, including Macintosh, systems. From the site: www.puppetlabs.com/puppet/introduction/ - Puppet is an open source data center automation and configuration management framework. Puppet provides system administrators with a simplified platform that allows for consistent, transparent, and flexible systems management. Puppet lets System Administrators spend less time on mundane tasks and instead focus on managing their infrastructure strategically. Additionally, Puppet can help establish and enforce approved system configurations automatically correcting systems that drift from their baseline ... projects.puppetlabs.com/projects/puppet/roadmap	4/9/2010
10-042	C10069	POSTMAX (version 2.0)	POSTMAX is a small program developed to statistically analyze MACCS2 output to determine a 95th percentile value for atmospheric dispersion (x/Q) as a function of weather data and site boundary distance. (http://int.lanl.gov/orgs/sbd/sbd-as/SQA/PostmaxSQAIndex.shtml)	4/9/2010
10-043	C10071	Prototype all sky imager FX correlator (PASIFX) version 1.0	This is research/example code for doing high-performance FX correlation on streaming radio telescope data. It is written in C and uses SSE, Pthreads and MPI. It performs the cross-correlations and also the polyphase FFTs required by an FX correlator. It is not a complete FX pipeline.	4/13/2010
10-044	C10070	Nuclear Power Human Resource Modeling Tool, V.0	The NPHR is a systems dynamics model of civilian nuclear power program constructed in the commercial software iThink. The model integrates nuclear power infrastructure with human resources to project human resource requirements to construct, operate, and regulate a nuclear power plant. The model includes outsourcing options and allows investigation of the impact of technology choices. The model is described in LA-UR 10-000768.	4/13/2010
10-045	C10075	RADIUS 2.0	C++ library and programs for image segmentation and polygonization. Duplicates and extends functionality of software described in LA-CCs 06-083, 09-032, 08-098, US patent 7127104. See also articles: L. Prasad, A.N. Skourikhine, "Vectorized Image Segmentation via Trixel Agglomeration", Pattern Recognition 39 (2006) 501-504, doi: 10.1016/j.patcog.2005.10.014 L. Prasad, S Swaminarayan, "Hierarchical Image Segmentation by Polygon Grouping", IEEE Conference on Vision and Pattern Recognition Workshops, 2008, doi: 10.1109/CVPRW.2008.4562980	4/19/2010
10-046	C10072	Parmteq, Version 3	Parmteq comprises a group of codes (PARMTEQ, RFQUICK, CURLI and PARI) that are used to design high-performance radio-frequency quadrupole (RFQ) linacs. PARMTEQ is an acronym for "Phase and Radial Motion in a Transverse Electric Quadrupole". These codes are necessary to design the RFQ vane profile and analyze the beam performance including the effects of higher order multipole field components and image charges. Multi-particle simulations are supported in Version 3. Manual: LA-UR 96-1836	4/19/2010
10-047	C10073	ParmteqM, Version 3	The RFQ Manufacturing Codes read RFQ design data generated by the code PARMTEQ and then generate and analyze machine instructions for numerically controlled machining of the vanes. Program VANES generates tool-path data for input to a numerically controlled milling machine. This code also creates data for final inspection of the vanes. TCORR corrects the VANES input file for differences between the RFQ operating temperature and the temperature at which the vanes are machined. TIPDIST calculates the tip-to-tip distances between vanes normal to the beam axis at each cell midpoint and at peaks and valleys in each cell. Manual: LA-UR 96-1836	4/19/2010
10-048	C10074	QCD Matrix Inversion, Vers. 08-2007.1	Fortran 90 code to carry out quenched lattice Quantum ChromoDynamics calculations using Message Passing Interface Version 1 for parallelization.	4/21/2010

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10-049	C10076	Geologic Modeling Collection of Codes	The software consists of a collection of Fortran programs, "C" shell scripts, and Arc Macro Language scripts (eternal scripting code created by the author for use by those who have ArcInfo (ESRI) software). These scripts and software were used in the generation of the 2009 Geological Framework Model Described in a digital report (LA-UR-09-3701) with accompanying digital models, graphics, photographs, map plates, digital data sets, and example computer codes and scripts. The codes provide examples of data capture, geologic contact point extraction, and the steps required to produce a 3-D digital geologic model defined by a set of grids, using standard computer languages and tools of the ArcInfo GIS (Geographical Information System) environment.	4/23/2010
10-050	C10077	expmom Version 1.0	Code implements the method of moments estimation described in Statistical Inverse Problems in Network Tomography (LA-UR-06-2861). The code provides a solution to the multicast exponential tomography problem. More explicitly, the code uses Gauss-Newton optimization to minimize the distance between observed and fitted values in order to estimate parameters for exponential queueing distributions on links in a packet-switched network like the Internet.	4/26/2010
10-051	C10078	DUCDAQ, ver. 1.0	DUCDAQ is a suite of slow-control programs that read out instruments monitoring the nEDM project's Dual-Use Cryostat (DUC), write data to a MySQL database, and display data from the database. Types of instruments include monitors for temperatures, pressures, cryogen levels, and leak rates.	4/30/2010
10-052	C10079	DGMACH 1.0	DGMACH is a framework for solving hyperbolic systems of partial differential equations using the discontinuous Galerkin numerical method. This release supports the following systems: a) single-material Euler equations for gas dynamics (gamma-law EOS), b) PI grey radiation model, coupled with Euler equations, c) isentropic Euler (treats isothermal and shallow-water), d) model 2x2 systems, e) model scalar systems. The time integration methods supported are explicit Runge-Kutta and implicit Newton-Krylov methods.	5/4/2010
10-053	C10080	3DSIM - Telemanipulator Arms: Virtual Reality Model - Version 1.0	The 3DSIM Telemanipulator Arms Virtual Reality Model is an immersive virtual reality 3D model of the devices used by technicians within hot cell environments. The model includes a user manual provided by the manufacturer of the telemanipulator arms. The virtual reality model engages a user in a video-game manner, to use the telemanipulator arm subsystem components.	5/5/2010
10-054	C10081	FCF with Data Enhancements - Virtual Reality Model Version 1.0	The FCF Data Enhanced Virtual Reality Model is a modified version of the FCF model covered under LACC-09-016. This version of the model has features that allow a user to left click on objects in the model and view simulated data such as images from a camera, data analysis from an instrument, and simulated swipe sample information.	5/5/2010
10-055	C10082	MADS ver 1.0	The code performs various types of model analyses and provides support for model-based decision making. The code can be executed under different computational modes which include (1) sensitivity analysis, (2) Monte Carlo analysis, (3) model calibration, (4) parameter estimation, (5) uncertainty quantification, and (6) model selection. The code provides (1) efficient parallelization (MPI and POSIX), (2) advanced Latin-Hypercube sampling techniques, (3) various gradient-based Levenberg-Marquardt optimization methods, and (4) advanced single- and multi-objective global optimization methods (including particles swarm optimization, PSO). http://www.ees.lanl.gov/staff/monty/codes/mads	5/7/2010
10-056	C10086	GeoMatTool Version 1.0	Code is a Java tool to facilitate estimation of parameters for a family of material models, support manipulation and plotting of data sets. (n.b. The restriction on distribution arises since this work was funded under a CRADA and as such distribution of the product is limited to the funding company.) LACC 09-050, earlier prerelease version of same project.	5/10/2010
10-057	C10087	CINDER90	CINDER90 is a multi-group depletion code developed at LANL. It is a tool for determining nuclear inventories in systems ranging from reactors to accelerators. Built upon an extensive self-contained nuclear data library, it is capable of tracking decay and reaction products with proton numbers $Z < 104$. Code methods include modern cross-section and decay modeling, fission product yields gas tracking, improved reaction chain logic, and either built-in or scripted interface options with modern transport codes such as MCNPX. The code contains post processing routines capable of providing regional or total nuclide atom densities, activity, decay and fission powers as well as dilution factors and decay product spectra for various particles.	5/14/2010
10-058	C10088	Shale Module V 1.X	Implementation of an oil shale specific material model as a ABAQUS user model. The package consists of oil shale specific models and ancillary modules for vector, tensor and eigenvalue/eigenvector capabilities of particular interest for mechanics.	5/14/2010

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10-059	C10089	KIVA-3VRealGas	KIVA-3VRealGas is a computer program for the numerical calculation of transient, two and three-dimensional, chemically reactive flows with sprays. It is an altered version of the earlier KIVA-3V code. KIVA-3VRealGas uses the Peng-Robinson equation of state (EOS) to better handle high-pressure conditions typical of diesel engine environments. The implementations modify pressure-volume-temperature relationships, specific heats, and departures in internal energy, among other thermodynamic partial derivatives. This implementation required significant changes throughout KIVA-3V to handle the new EOS and subsequent internal energy equation changes but all else is essentially left unchanged from KIVA-3V.	5/27/2010
10-060	C10090	LANLPOSINST, Version 6.0	Monte Carlo simulation of low-energy electron cloud generation by beam-induced multipacting at the vacuum chamber surfaces in proton storage rings. Includes space charge effects and tracking of the electrons making up the electron cloud in various accelerator components. Seed electrons are generated by beam losses at the chamber walls and/or residual gas ionization. Detailed model of secondary emission from electrons striking the vacuum chambers surfaces uses the Furman and Pivi phenomenological formulation in POSISNT 12.1 as obtained from M. Pivi, SLAC.	6/2/2010
10-061	C10091	HFV database	A database containing published viral genetic sequences and a tool set to analyze those.	6/4/2010
10-062	C10092	Xgrid Management suite	A set of scripts to automate management and configuration of Xgrid distributed computing. Xgrid is Apple's grid computing software that is built into all versions of the OS. Managing this grid for scientific users requires administration and techniques for packaging jobs and configuring servers. This set of tools automates many chores. While dramatically useful to my operations, in its raw form this is too site specific to have general value.	6/4/2010
10-063	C10093	Distributed Source-Term Analysis Generalized Solver, Version 1.0.0.0	Distributed Source-Term Analysis is a measurement and analysis technique that has been applied to a variety of safeguards applications to determine the locations and quantity of material contained within large volumes. This tool is an excel worksheet using VBA code that provides easy loading of measurement and response matrix data and calculates the source and error activity within a facility. The tool will assist in the clean up and increase the amount of recoverable material within said facility.	6/8/2010
10-064	C10094	SpacePy 0.1.0	SpacePy is a library of Python modules and extensions. Current capabilities: conversions between a number of time standards; basic coordinate conversions between commonly used systems, both geocentric and helio centric; superposed epoch analysis; visualization of output from Space Weather Modeling Framework simulations; reading of NASA CDF files; a one-dimensional radial diffusion code and visualization methods; calculation of electron drift shells, and access to magnetic field models (using a Python-wrapper for the ONERA library, an open source library developed at CNRS, France); a number of convenience routines for e.g. windowing means, set operations on times, file input/output.	6/18/2010
10-065	C10096	Bayes Inference Engine (BIE), Ver 7.45	The Bayes Inference Engine (BIE) has been developed at LANL by DX-3, starting in 1993. Since 1996, the development and maintenance of the BIE has been a collaboration with the AWE. This collaboration was set up to deal with ill-posed (limited data) radiographic problems in 2D and 3D density reconstructions using the Bayesian approach. In the Bayesian framework, all available information (data and prior information) can be combined in a logically consistent manner enabling scientists to carry out scientific inference or plausible reasoning in their analysis. The reconstructed density information is used for validating hydrocode models.	6/21/2010
10-066	C10095	HPC Operational Suite	General samples of software in shell and scripting languages used in the general operation and maintenance of Linux-based high performance computing (HPC) clusters and associated infrastructure. This example software will not differ substantially in capabilities and/or methods from software used on similar Linux-based HPC clusters and infrastructure in other HPC Centers.	6/23/2010
10-067	C10097	Glimmer, the Community Ice Sheet Model (Glimmer-CISM), Version 2.0	Glimmer-CISM is an open-source ice sheet model that is being used to simulate the evolution of the Greenland and Antarctic ice sheets in both standalone and coupled climate simulations. The model is hosted on the BerliOS code repository. Version 2 will include two major advances relative to version 1 (which was developed without LANL participation): (1) two higher-order ice dynamics schemes (one developed by Payne and Price, the other by Johnson and Bocek) and (2) new interfaces by Lipscomb, which allow Glimmer-CISM to run as part of the Community Earth System Model.	6/24/2010
10-068	C10106	Identi-Finder Checkpoint Search	The virtual reality model submitted for LACC under this form was created as a demonstration of technical capability in the realm of high fidelity visualization and computer graphics. The virtual reality model, "Identi-Finder Checkpoint Search" was created to be demonstrated at the 51st INMM Conference in Baltimore, Maryland, as well as other conferences where LANL has a technology demonstration booth.	7/2/2010

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10-069	C10102	Amanzi 0.x	Amanzi provides a flexible and extensible parallel multiphase, multicomponent, flow and reactive transport simulation capability for environmental applications. It includes toolsets for meshing infrastructure, discretizations, and solvers for the resulting nonlinear systems of equations. Amanzi is used to model contaminant migration at various DOE waste sites and is generally applicable to contaminant migration in groundwater/surfacewater under partially saturated, nonisothermal conditions. Development of Amanzi is funded by the DOE Office Environmental Management under the Advanced Simulation Capability for Environmental Management (ASCEM) program.	7/8/2010
10-070	C10101	Simulated Nuclear Control Room	The virtual reality model submitted for LACC under this form was created as a demonstration of technical capability in the realm of high fidelity visualization and computer graphics. The virtual reality model, "Simulated Nuclear Control Room" was created to be demonstrated at the 51st INMM Conference in Baltimore, Maryland, as well as other conferences where LANL has a technology demonstration booth.	7/8/2010
10-071	C10099	DSDdriver and DSD library, Version 1.0	DSDdriver calls the DSD library to compute high-explosive burn times and detonation velocity to be used by Lagrangian and Eulerian hydrocodes. DSDdriver implements the Detonation Shock Dynamics theory and model (also referred to as DSD) as developed at LANL, principally by members of group DE-9.	7/8/2010
10-072	C10100	Cell_Interpolation	This code creates an EOS perfect gas table consisting of densities, temperatures and pressures in the Roadrunner Architecture. It also, creates a list of densities and temperatures. Then, it finds a pressure for each pair of density and temperature in this list by interpolating these values on the EOS initial tables. This kind of interpolation is necessary Hydro Codes and will be useful for running such codes in the Roadrunner architecture computers. Presently, it will be used as a test in some machines (Garnet, for example).	7/14/2010
10-073	C10098	MultiVapor 2.2.3 (11/19/09)	MultiVapor is a computer tool for estimating breakthrough times and service lives of air-purifying respirator cartridges manufactured to remove toxic organic vapors from breathed air. It can also be used for larger filters and for carbon beds of any size prepared for laboratory studies.	7/22/2010
10-074	C10109	xRAGE, Version 1003.00	The ROXANE code has been incorporated into the xRAGE code. The ROXANE code is a Eulerian Code, which is part of the Eulerian Refractor that code developers are currently working on. The xRAGE and ROXANE codes are one-, two-, and three-dimensional multi-material Eulerian hydrodynamics codes developed by LANL for use in solving a variety of high deformation flow of materials problems. The distinguishing characteristic of xRAGE and ROXANE is the ability to model diffusive radiation treatment.	7/26/2010
10-075	C10105	Image Alignment, Version 3	Aligns two still images using unique algorithms. Works with a variety of image sources. Handles both translation and rotation.	7/27/2010
10-076	C10108	HIV sequence database dump file	The dump file contains all the data and schema of the HIV sequence database.	8/2/2010
10-077	C10107	WinNSigma, Version 1.3	N-Sigma is the term used to describe the radiation portal monitor gamma alarm threshold, in units of the standard deviation of the background gamma count rate. The portal monitor separation, vehicle speed, and background count rate, among other factors, all enter into the N-Sigma calculation. The calculation of a gamma threshold is illustrated numerically. This code calculates N-Sigma for use in deciding what the gamma alarm threshold should be.	8/4/2010
10-078	C10111	vrtsplit1.pl, Version 1	This is a PERL script that calculates MCNP cell importances from a previous output file. Values are calculated to equalize tracks entering a group of cells. The cells are assumed to be more or less in a direct line between the source cell and the tally region. The output file is specified as the first command line argument to the script. An optional second command line argument is permitted for a file containing a list of problem cells for which the importances are calculated; otherwise, importances are calculated for all cells. Results are written to terminal window and to two different output files. Including comment lines, the script is approximately 220 lines.	8/12/2010
10-079	C10112	Kip, Version 1	This high-performance ray tracing library provides very fast rendering, compact code, type flexibility via C++ 'generic programming' techniques, and ease of use through an application programming interface (API) that functions independently of any GUI, on-screen display, or other enclosing application. Kip supports constructive solid geometry models based on any of several built-in shapes and operators, and allows for new, user-defined shapes and operators. Additional features include basic texturing, input/output of models using a simple human-readable file format with full error checking and detailed diagnostics, and support for shared data parallelism. Kip is written in pure, ANSI Standard C++, is entirely platform independent, and is very easy to use, as it requires no build system, configuration or installation scripts, wizards, special preprocessing, makefiles or external libraries.	8/19/2010

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10-080	C10117	SimCore, Version 1	SimCore is a C++ based, object-oriented and templated library of distributed discrete-event simulation engine. A technical user manual is given in LA-UR-07-0590.	7/25/2010
10-081	C10118	PacketSim, Version 1	PacketSim is a C++ based, object-oriented and templated software tool that relies on the SimCore code and simulates communication networks on a per-packet-level. An introduction to the code is given in LA-UR-06-2523.	7/25/2010
10-082	C10114	LANL ISIS code	This software suite contains the code to read data from the ISIS instrumentation, process that data, visualize it, as well as a control GUI. This software suite does not contain the actual logic for the command and control of the system.	8/30/2010
10-083	C10115	DGSDEF (Discrete Gamma Source DEFinition)	The current functionality allows for quick and robust calculations of the discrete prompt and delayed gamma source terms from materials with complex isotopic inventories. The code partially incorporates the CINDER depletion tool and library developed at T-2 of LANL. The calculation accounts for the initial compositions and possible transmutations in the material under various experimental conditions. Combined with a transport code (currently MCNPX) the calculation accurately predicts gamma spectra observable in experimental conditions. The code performance was verified within specifically organized experimental campaign.	8/31/2010
10-084	C10116	454 VelvetFinishing	This software suite uses the output of 454Newbler assembly and Velvet assembly to create an optimal compiled assembly by screening data, removing various reads, chunking data into fake reads and running Velvet with a number of Kmer settings to determine the best assembly.	8/31/2010
10-085	C10119	Safeguards by Design of an Electrochemical Reprocessing Plant	The virtual reality model was created as a demonstration of capabilities in the realm of safeguards by design using computer graphics. The virtual model was created to be demonstrated and used as a visual aid in a presentation.	9/10/2010
10-086	C10120	Publications Database Search Engine, Version 1.0	This script was written as a search engine for an online list of unclassified publications. It was designed for the CCS-2 green network website, but as of yet had not been used in any official capacity.	9/13/2010
10-087	C10121	MEAM Extensions, Version 0	Igor Pro application code for development and testing of Modified Embedded Atom atomistic potentials.	9/13/2010
10-088	C10122	PPLB3,Version 0	Igor Pro application code for development and testing of Perdew-Parr-Levy-Baldur concepts of atomistic embedding energies.	9/13/2010
10-089	C10123	Potential Fitter, Version 0	Igor Pro application code for development and testing of metallic atomistic potentials.	9/13/2010
10-090	C10124	Oxide Potentials, Version 0	Igor Pro application code for development and testing of oxide atomistic potentials.	9/13/2010
10-091	C10125	Waste Create Assay System International Neutron Coincidence Counting, Version 1.1.1.0	This is an update to N-1's WCAS INCC 1.06 code used at the Rokkasho Reprocessing Plant in Japan. WCAS INCC is a unique branch of an early INCC version from INCC 4.0. This release includes several improvements from the original version from 2002. (LA-CC-02-020). There are no specific software documents for the WCAS INCC software, instead we ship it with the INCC User Guide, LA-UR-01-6761. The improvements to WCAS INCC from the pre-2006 versions add new features and robustness to the overall WCAS system.	9/14/2010
10-092	C10126	International Neutron Coincidence Counting, Version 5.1.2.3	This is a much improved release of our INCC 5.04 code used by IAEA, DOE, LANL and Euratom. LA-CC-98-02. The User Guide is LA-UR-01-6761. Since 2003 the software has been enhanced with numerous improvements and bug fixes. The software is used solo for neutron measurement and analysis. INCC is also bundled with the N division UNARM software suite currently used by organizations such as the IAEA and JNFL.	9/13/2010
10-093	C10128	CCBlaster, Version 1	CCBlaster is a command and control tool that uses peer-to-peer technology to distribute software updates to a large set of end hosts using standard authentication mechanisms to prevent attacks against this scheme.	9/21/2010
10-094	C10127	FastTrans, Version 1	FastTrans is a C++ based, object-oriented and templated software tool that relies on the SimCore code and simulates vehicular transportation networks on individual vehicle level. An introduction to the code is given in LA-UR-10-03780.	9/21/2010
10-095	C10129	Unattended and Remote Monitoring Software Baseline 2 Revision 1 (UNARM B2R1)	UNARM B2R1 is an assortment of software applications for collecting, storing and analyzing radiation data from various types of instruments.	9/21/2010

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10-096	C10132	Cascade, Version 1.0	Code calculates the internal mass flow and binary species concentration for a 1-up 1-down GCEP operation including arbitrary number of stages, feed stage, recycle from product head to a stage, and percent recycle. The code uses a constant stage separation factor and cut in performing the calculation and will output the product and tail flows and enrichments, SWU and a cascade layout based on a given number of units. The I/O is done through a GUI. The underlying computer framework is MATLAB and other distributed code will be compiled and includes the MATLAB RTL. The reference document is LA-CP-09-01581.	9/24/2010
10-097	C10130	XXLM_LOAD_CAT_CODE S_PRC.sql, Version 1.0 2009/06/24	The XXLM_LOAD_CAT_CODE software procedure uploads category codes to LANL's 11i Manufacturing Application software system database. The XXLM_LOAD_CAT_CODE procedure calls an Oracle provided 11i Manufacturing system API, called create_category API to create the new mtl_categories records. API stands for application program interface. Oracle Corporation provides API software, a standard Oracle software tool available to any licensed user of an Oracle Application and/or Oracle Database, to transfer data from an external source to an oracle base table.	9/27/2010
10-098	C10131	Turbine Steam Flow Model, Version 1.0	3-D interactive Virtual Reality Model showing a generic turbine used in nuclear engineering studies and plant design. The turbine does not represent any actual or real turbine hardware; instead it is a representation of a concept of how turbine steam flows through a generalized system. The model allows a user to peel the turbine hardware apart and see how steam moves through the system in a profile view. There are no physics or mathematics driving the model. The model is an artistic representation only - derived from drawings and generic information taken from the internet.	9/30/2010
10-099	C11001	Gaussian Plume Dispersion Model, Version 1.0	The Gaussian Plume Impact service calculates the dispersion of an agent across a region. The model uses a selected wind speed, wind direction, and release location to estimate airborne downwind agent concentrations. Currently, the agent is assumed to be a non-reactive (inert) gaseous agent and is released continuously thus the steady-state airborne concentration is calculated.	10/1/2010
10-100	C11002	FastPop, Version 1.0	The FastPop model uses geospatial data queries to determine the estimated population living and working in a specified area. These populations statistics are used to determine the population at risk during national significant events. This code base is designed to provide results via web-services.	10/1/2010
10-101	C11003	FastECON, Version 1.0	FastECON is a geospatial tool that quickly captures all the business and government activity within any given area of the United States. These economic/business activity are used to determine the aspects of the economic risk during national significant events. This code base is designed to provide results via web-services.	10/1/2010
10-102	C11004	DeCE, Version 1.0	DeCE is a code used to manipulate nuclear data files interactively, which are in ENDF-6 format commonly used in the nuclear data libraries in the world. DeCE has several features that help ENDF-6 formatting work: (1) renumbering all the card images and update dictionary section in the nuclear data file; (2) facilitates all ENDF-6 data file manipulations, for example, add two data sections, renormalize data, add/delete data point; (3) convert model calculation results into ENDF-6 format; (4) reconstruct point-wise cross sections from resonance parameters; and (5) convert ENDF-6 formatted data into a human readable format.	10/1/2010
10-103	C10110	FSP_Toolkit, Version 1.0	This MatLab script is based upon previous publications by the author (Munksy) and uses Finite State Projections to solve the Chemical Master Equation for discrete stochastic reactions on a two-dimensional lattice. Code provides a graphical user interface. Examples are used to illustrate key biological phenomena: feedback for noise suppression, stochastic amplification/damping resulting from non-linear reactions, stochastic switching, and stochastic resonance. The code and examples are described in tutorial chapter, "Modeling Cellular Variability" to be published in Quantitative Biology From Molecular to Cellular Systems, Michael E. Wall (editor), Taylor and Francis, Inc. (publisher).	10/5/2010
10-104	C11006	LQD_RED, Version 1.0	LQD_RED is a data reduction software for Small Angle Neutron Data collected at FP10 (LQD) at the Lujan Center, LANSCE. The code allows to translate the raw data collected on LQD into the common data format (intensity vs. Q) used for Small Angle Neutron Scattering.	10/6/2010
10-105	C10104	Algorithmic Approach to Optimization of Photocathode Stoichiometry, Version 1.0	Based on the automated programmable control of each process variable, achieved using an hierarchical program implemented in Labview, we have introduced an algorithmic approach to optimization. The key to this optimization is an ability to measure spectral response across a wide range of wavelengths (several hundred nanometers) after each key film growth process. Multiple samples are then grown using known variations in the target parameters. By observing the effect of each variation on spectral response, trends emerge which reveal how each growth step and/or parameter should be adjusted to optimize response at a specific wavelength.	10/8/2010

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10-106	C10103	Photocathode Fabrication Hierarchical Programmed Control and Automation, Version 1.0	Repeatable fabrication of high efficiency photocathodes is achieved by introducing programmable control and automation to process variables. Optimization is then performed using separate techniques and a film growth process is identified which stipulates target values for each of the parameters. An optimized cathode chemistry then becomes highly repeatable because the automated control can exactly replicate the process steps. In practice, the target parameter variables (i.e., film thickness, temperature, etc.) that uniquely identify the film are loaded into the software as an input deck. The automated control is then initiated which executes the film growth and monitors, adjusts, and records each parameter status on user selectable time intervals (default is 0.5 seconds).	10/8/2010
10-107	C11007	py_siminput, Version 1.0	A collection of Python modules that build text input files for simulation codes. The library allows a user to write a Python script that defines the input values and the library then generates an XML file input or flat text file that a simulation code would then read.	10/12/2010
10-109	C11010	C155 Practicum Exercise Model, Version 2.0	3-D Interactive Virtual Reality Model showing a simulated nuclear safeguards system located in an open building on LANL property. The model is used for training a lesson in the Radiation Review/Multi-Instrument Collection course taught by LANL employees each year to IAEA inspectors. The model is a representation of simulated components of a simple nuclear safeguards system, intended to help students understand basic challenges and limits to camera equipment and non-destructive assay equipment, as well as the value of adherence to material handling protocols and verification of those protocols.	10/18/2010
10-110	C11011	Input Geometry and Source Files for GEANT4 Study of Detector Effective Depth	This source code details the geometry and radioactive source input for the study of the effective depth of a gamma-ray detector crystal. It is not stand-alone software but requires the installation of the open-source Monte Carlo toolkit GEANT4 (http://geant4.cern.ch). In this way it is analogous to a MCNP input deck. The code allows the user to simulate a point source of gamma-ray radiation (Cs-137 in the present case) and the interaction of this radiation with a high-purity germanium crystal to determine how deep on average those gamma rays penetrate into the crystal. A table is also simulated for scattering purposes. This code is intended for the Chinese Institute of Atomic Energy Waste Counter collaboration with LANL.	10/20/2010
10-111	C11012	Reactivity Sum, Version 0.5	The code predicts metabolic reactions based on atomic and molecular properties of small molecular compounds.	10/25/2010
10-112	C11022	Generic Enrichment Cascade, Version 1.0	This model shows basic elements of an enrichment cascade and associated hardware as it would be used in an operational configuration. The model is not based on specific information and is intended as a generic familiarization and learning utility to educate nuclear inspectors and/or safeguards professionals in the arena of commonly observed hardware in nuclear material processing activities.	10/28/2010
10-113	C11023	Vehicle Portal Monitoring Training Exercise, Version 1.0	This model depicts a fabricated vehicle survey checkpoint. The scenario shows a vehicle setting off a radiation detector with subsequent search of the vehicle. The model assesses trainee performance of the proper procedural steps for conducting a vehicle search.	10/28/2010
10-114	C11024	Global Security Highlights Model, Version 1.0	This model includes a fabricated Mixed Oxide nuclear facility with generic material processing stations in place. The model includes descriptions and models of hardware and technology developed by LANL and used by the IAEA for implementing nuclear safeguards systems across the world. The model is intended as a proof of concept for capabilities available within LANL	10/28/2010
10-115	C11015	ChemCamOps Alpha Release	ChemCamOps is an IDL program that will allow for display and analysis of ChemCam LIBS data. It will display the raw spectral data from LIBS and allow for other data processing on the data, via buttons that will call other codes developed by the ChemCam Software Team.	11/2/2010
10-116	C11013	Lisp Modules for Interactive Beam Transport Code	Accelerator codes are used to compute the movement of a particle beam through an accelerator. The most common purposes of codes like these fall into two classes: design codes and simulation codes. Design codes are used to compute the parameters that define the geometry and operating characteristics of accelerator components. Simulation codes are meant to study the movement of the beam through an existing structure.	11/2/2010
10-117	C11014	Modules for 3D Particle-in-Cell Plasma Simulator	The code is a collection of modules intended to build a particle-in-cell (PIC) code for simulating plasmas. A plasma is essentially a collection of positive and negative particles (such as protons and electrons) which interact through electric and magnetic forces. Plasmas are important components of various technologies, like ion sources for accelerators. PIC simulation is based on the idea that the behavior of a plasma can be mimicked by virtual particles that obey the same or similar laws than the real physical system.	11/2/2010

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10-118	C11016	WINT-2D, Version 0	WINT-2D is designed to aid experts in performing wind resource analysis over broad areas using imported 10 m wind station data, an interpolation scheme and a basic treatment of terrain effects. It is designed to be used over large areas, identifying smaller regions for further study.	11/3/2010
10-119	C11017	Gamma Fitting, Development Version	Code implements improved method of deconvolving overlapping gamma peaks at 511 KeV (positron annihilation) and 514 KeV (Sr-85).	11/5/2010
10-120	C11018	HPCSim, Version 1.0	HPCSim is a C++ based, object-oriented and templated software tool that relies on the SimCore code and simulates distributed filesystems, including input and output requests, the ability to replay trace data. Subsequent versions will include models for interconnects and compute node models (thus the name).	11/8/2010
10-121	C11019	McPhd, Version 1.0	McPhd is a research code designed to explore the application of the Haskell programming language to Monte Carlo algorithms. Specifically, it will examine the use of language features in Haskell to obtain good parallel performance on a single multi-core machine.	11/8/2010
10-122	C11021	MESA++, Version 0.1	MESA++ is a collection of C++ wrappers for MESA, a public open source collection of code components for stellar astrophysics. It facilitates the use of MESA components which are written in Fortran95, in C++ coding environments.	11/9/2010
10-123	C11025	Continuum Dynamics Evaluation and Test Suite (CODY), Version 1.0	This 2-D and 3-D continuum dynamics mini-application is designed to test and evaluate the CUDA and OpenCL programming models. This code is also used to test and evaluate emerging heterogeneous computing hardware including laptops, workstations, and large clusters.	11/16/2010
10-124	C11026	MHD3D	The code provides a magneto-hydrodynamics (MHD) solver for a single 3-D grid using dimensional split method.	11/16/2010
10-125	C11027	BABBO, Version 1.0	BABBO is a mesh adaptation code that combines Adaptive Mesh Refinement with a mesh relaxer. Typically, mesh relaxation is used as a mesh optimization technique in Arbitrary Lagrangian Eulerian hydro codes, while AMR is typically used in Eulerian hydro codes. The combination of these two techniques allows a computational mesh to mirror local and global spatial symmetries as well as spatially resolve modal structures inherent in the physics of the simulation. The BABBO code capability can be applied to any quadrilateral lagrangian hydro scheme that contains zone centered thermodynamic variables and vertex centered kinematic variables to create what would be AMR/ALE hydrodynamic capability. We plan to use BABBO as a research tool.	11/16/2010
10-126	C11028	generate-hh, Version 4.5.1.1	generate-hh is a patch to gfortran 4.5.1 that changes its behavior only if a fgenerate-hh flag is specified in the command line. If present this flag causes gfortran to generate a .mod.hh file alongside every Fortran.mod file that contains C++ declarations of the functions in the Fortran module. This facilitates interlanguage operability.	11/16/2010
10-127	C11029	designplot, Version 1.0	The code reads in a matrix from a text file and plots all of the two-dimensional projections. The intended use is as a diagnostic tool for checking the space-filling properties of an experimental design.	11/19/2010
10-128	C11020	AST.Net, Version 2.0	AST.Net, version 2.0 is a web-based program built with ESP web forms connecting to a SQL Server database. It is hosted on a LANL institutional web server and requires LANL cryptocard authentication for use. IT is an unclassified system and resides on the LANL Yellow Network.	11/23/2010
10-129	C11030	Recon, Versions 2.0 (development series) through 2.0 SQA (release)	Recon is a general purpose code written at LANL to perform Computed Tomography (CT) reconstructions. Beginning with a set of 2-D transmission x-ray or equivalent images (scan data) and user input to describe the problem. Recon computes a volumetric distribution of x-ray attenuation coefficients, analogous to density. Recon contains several reconstruction algorithms depending on scan parameters: 2-D parallel and fan beam, 3-D cone beam by the Feldkamp method, and 3-D exact cone beam by the Katsevich method. In addition to the reconstruction, Recon performs image processing tasks including detector calibration, filtering, calculation of attenuation images, generation of sinograms, and centering. Recon employs parallel processing at various levels.	11/29/2010
10-130	C11009	Total-Variation Regularized Numerical Differentiation	The code computes the derivative of a function specified by possibly noisy data. The code uses total-variation regularization to suppress noise. In contrast with existing methods, this approach allows for the computation of discontinuous derivatives.	12/15/2010
10-131	C11031	VERA, Version 0.3	Visualization system for executable traces and analysis. Interfaces with other freely available code. Patent has been filed.	12/16/2010
10-132	C11032	NJOY, Version 2010	Nuclear Data Processing System that processes nuclear data in the evaluated nuclear data form (ENDF) into forms used for nuclear applications including multigroup and Monte Carlo methods.	12/20/2010

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10-133	C11033	xRAGE, Version 1009.00	The ROXANE code has been incorporated into the xRAGE code. The ROXANE code is an Eulerian Code which is part of the Eulerian Refractor that code developers are currently working on. The xRAGE and ROXANE codes are one-, two-, and three-dimensional multi-material Eulerian hydrodynamics codes developed by LANL for use in solving a variety of high deformation flow of materials problems. The distinguishing characteristic of xRAGE and ROXANE is the ability to model diffusive radiation treatment.	12/20/2010
10-134	C11034	LANL Nuclear Weapon Analysis Tools, Version 5.5	The Tools are 8 different applications in JAVA or with JAVA GUI drivers executing FORTRAN code. These are engineering level models, developed from or directly using legacy models from other organizations such as DTRA and Sandia National Laboratories. LACPs 04-0009, 09-01571, 09-01662, 08-00759, 00-377, 00-459, 97-233, 02-107, 09-00959, and 10-01425 are user guides and references. The codes allow the analysis of weapon effectiveness against large target sets, the calculation of nuclear effects, probability of damage, radiation transport, ground shock, and earth penetration. LA-CC-08-075 is the release of an earlier version of the software.	12/20/2010
10-135	C11035	Cost Optimal Variance Reduction Technique 2D (COVRT2D)	COVRT2D is a 1- and 2-D (and possibly, though untested 3-D) deterministic Sn code that optimizes weight-window lower bounds for subsequent use in MCNP. The code performs a deterministic adjoint calculation to obtain an initial estimate of the weight windows. Then, regions of the weight windows are optimized by a gradient-descent algorithm that minimizes the cost, defined as the variance times the computation time divided by the mean squared, of a single-tally MCNP calculation. The mean and variance are calculated by COVRT2D while the time for the computation is only estimated. This code was used to complete Clell Solomon's Ph.D. dissertation work LA-UR-10-0848.	12/21/2010